Family STEM Activity

Our Place in Space

For young scientists ages 6 –10 Order and classify some of the objects in our universe.

Prep Time: 15 minutes ▪ **Activity Time:** 15 minutes or longer

Materials (printer required):

- 15 printable Universe Cards containing images and information about astronomical objects (pages 3 – 9)

1 Print out the Universe Cards double-sided if possible, or print single-sided and attach the information card for each object on the reverse side of the image of that object. Print the image card in color if you can.

2 Once you have assembled the cards, they can be used either as fact cards or for a variety of activities, including:

Put the Universe in Order by Distance to Earth
Organize the object cards by their distance from Earth starting with the closest object to us and continuing to the farthest. *See page 2 for the correct order.*

Put the Universe in Order: Size
Organize the object cards by their size starting with the smallest object and continuing to the largest.

Object Classification
Classify the objects in a variety of ways. You can even come up with your own categories of classification. Here are just a few ideas:

- Classify by object type: is the object a planet, moon, star, galaxy, etc.?
- Classify by location in the universe: is the object in our solar system, the Milky Way Galaxy, or beyond?
- Classify by age: research the age of each object and place in order from youngest to oldest.

Share Your Results with Us on Social!
#MOSatHome

Museum of Science®

Our Place in Space
ANSWER KEY

Order of the objects from closest to farthest from Earth:
International Space Station, Moon, Mars, Sun, Saturn, Pleiades, Orion Nebula, M13 Globular Cluster, Large Magellanic Cloud, Andromeda Galaxy, one of the Galaxy Clusters (Stephan's Quintet or Virgo Supercluster; Although Stephan's Quintet is farther from Earth it is impossible for a student to know this just from knowing that the image shows a galaxy cluster), Hubble Deep Field

Order of the objects from smallest to largest:
International Space Station, Moon, Mars, Saturn, Pleiades, Orion Nebula, M13 Globular Cluster, Large Magellanic Cloud, Andromeda Galaxy, Stephan's Quintet, Virgo Supercluster, Hubble Deep Field

Classifying by type:
Sun (star), Moon (moon), Space Station (space craft), Mars (planet), Saturn (planet), Orion (group of stars), Orion Nebula (nebula), Pleiades (group of stars), Magellanic cloud (galaxies), Andromeda galaxy (galaxy), Stephan's Quintet (galaxies), Virgo Supercluster (galaxies), Hubble Deep Field (galaxies), M13 Globular Cluster (galaxies)

Classifying by location:
Sun (solar system), Moon (solar system), Space Station (solar system), Mars (solar system), Saturn (solar system), Orion (milky way), Orion Nebula (milky way), Pleiades (milky way), Magellanic cloud (beyond the milky way), Andromeda galaxy (beyond the milky way), Stephan's Quintet (beyond the milky way), Virgo Supercluster (beyond the milky way), Hubble Deep Field (beyond the milky way), M13 Globular Cluster (beyond the milky way)

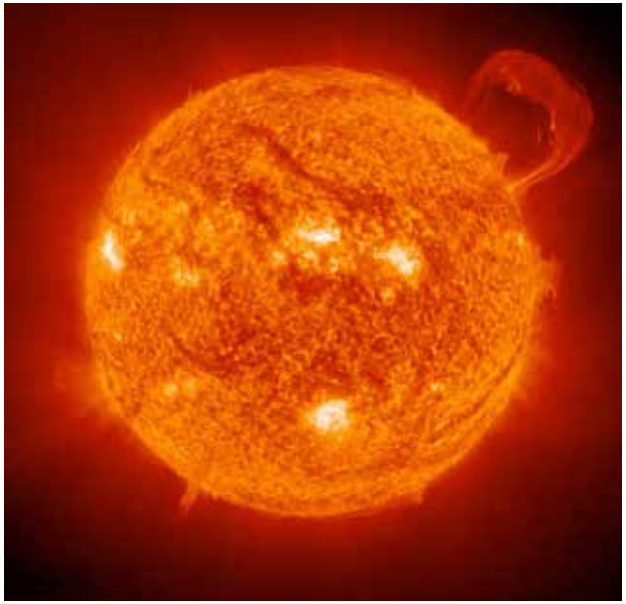
Classifying by age:
Sun (4.6 billion years old), Moon (4.5 billion years old), Space Station (22 years – launched in 1998), Mars (4.6 billion years), Saturn (4.5 billion years), Orion (~35,000 years old), Orion Nebula (3 million years old), Pleiades (100 million years old), Magellanic cloud (1.1 billion years), Andromeda galaxy (10 billion years), Stephan's Quintet (all galaxies are >10 million years old), Virgo Supercluster (made of many galaxies of different and unknown ages), Hubble Deep Field (made of many galaxies of different and unknown ages), M13 Globular Cluster (made of many galaxies of different and unknown ages).

Additional Questions and Resources:

- What other objects in the solar system and our broader universe could you add to this list? Where would these objects fit in your order of size, distance, etc.?
- Go outside together and look for some of these objects in the sky. Many websites and star gazer apps can help you find and identify these objects.

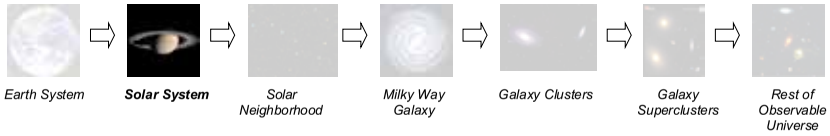
Share Your Results with Us on Social!
#MOSatHome

Museum of Science.



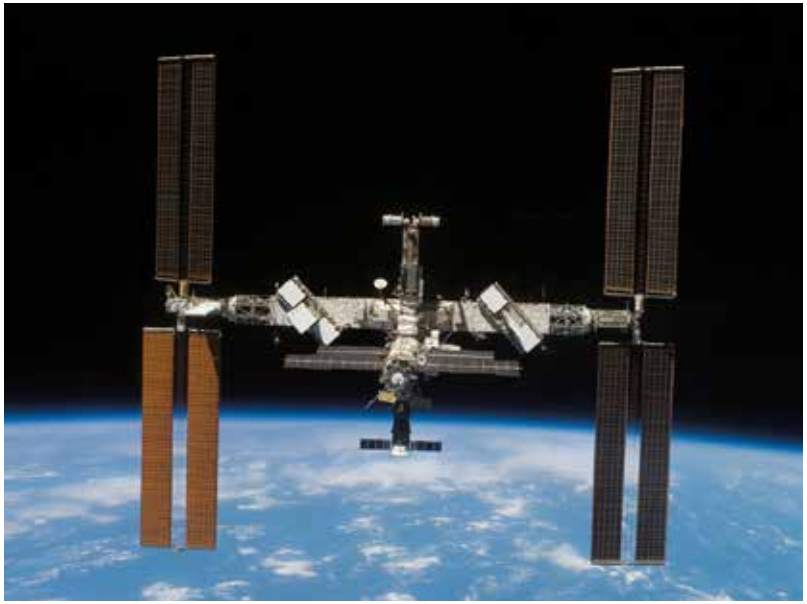
Object:	Moon
Location:	Earth System
Size:	Diameter = 3,500 km (2,000 miles)
Distance:	Average of 384,000 km from Earth (240,000 miles)

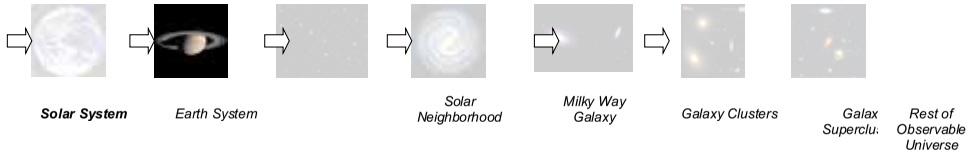
Size of the Moon Compared to the Earth. © Walter Myers



Object:	Sun (photographed in ultra violet light)
Location:	Solar System
Size:	Diameter = 1,391,000 km (864,000 miles)
Distance:	Average of 149,600,000 km from Earth (93,000,000 miles)

Size of the Sun Compared to the Earth



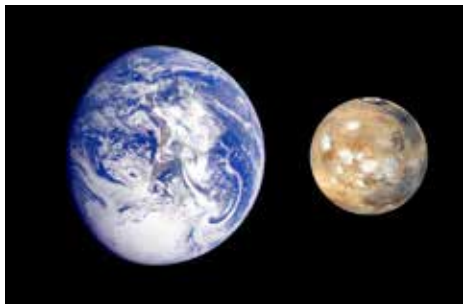


Object: Mars

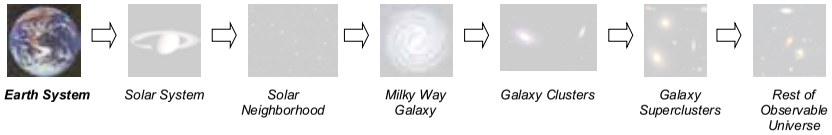
Location: Solar System

Size: Diameter = 7,000 km (4,000 miles)

Distance: Average of 227,900,000 km from Sun (142,000,000 miles)



Size of Mars Compared to the Earth

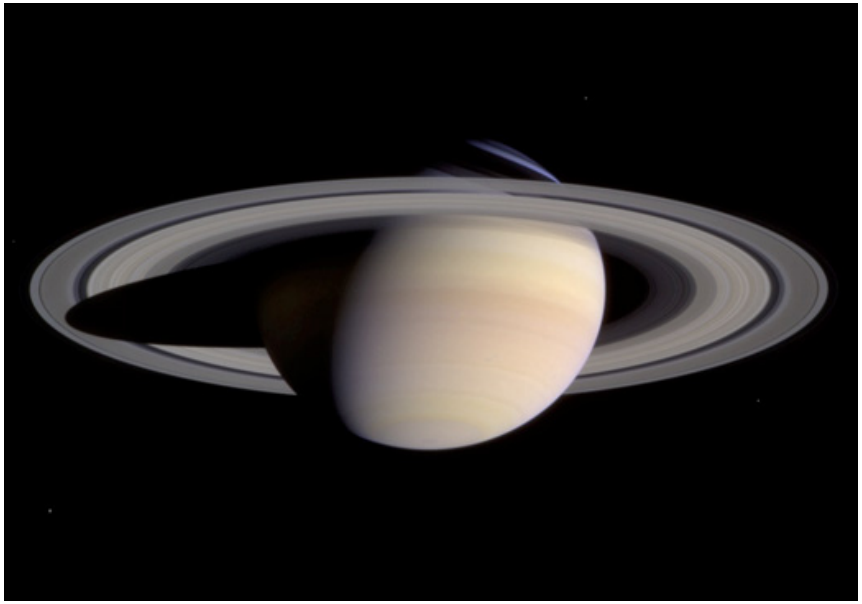


Object: International Space Station

Location: Earth System

Size: When completed it will be approximately 108 x 73 m (354 x 240 ft)

Distance: Average of 400 km from Earth (250 miles)



Object:

Location:

Size:

Distance:

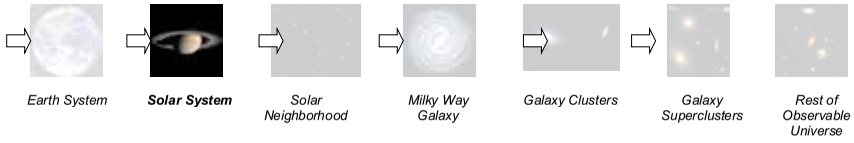
Stars of Orion, Canis Major, Canis Minor and other winter constellations

Solar Neighborhood

N/A

Varies; most are in our spiral arm of the Milky Way

10 brightest stars visible from N. Hemisphere	Distance (ly)
1) Sirius	9
2) Arcturus	37
3) Vega	25
4) Capella	42
5) Rigel	770
6) Procyon	11
7) Betelgeuse	430
8) Altair	11
9) Aldebraran	65
10) Spica	260



Object: Saturn

Location: Solar System

Size: Diameter = 120,000 km (75,000 miles)

Distance: Average of 1,427,000,000 km from Sun (887,000,000 miles)

Size of Saturn Compared to the Earth

Image courtesy of "Where is M13?" by ThinkAstronomy.com

Object:	Pleiades star cluster – M42 (constellation Taurus)
Location:	Milky Way Galaxy (in our spiral arm of the galaxy)
Size:	13 x 13 ly
Distance:	410 ly from Sun

Location of Pleiades in our galaxy (Sun is orange

Image courtesy of "Where is M13?" by ThinkAstronomy.com

Object:	Orion Nebula – M42 (constellation Orion)
Location:	Milky Way Galaxy (in our spiral arm of the galaxy)
Size:	40 x 28 ly
Distance:	1,600 ly from Sun

Location of Orion Nebula in our galaxy (Sun is

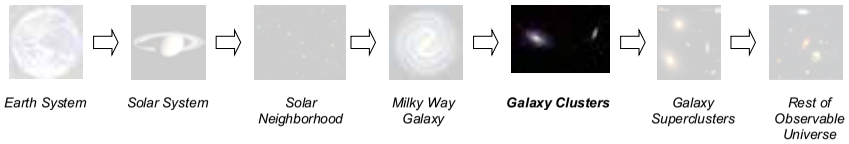
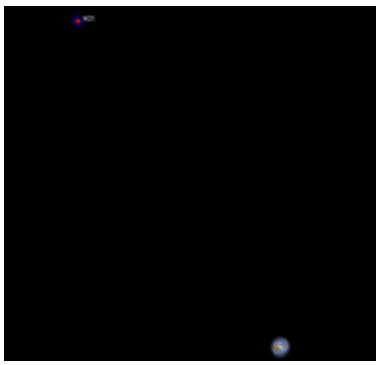


Image courtesy of "Where is M13?" by ThinkAstronomy.com

Object:	Andromeda Galaxy – M31 (constellation Andromeda)
Location:	Galaxy Cluster (in our Local Group of galaxies)
Size:	124,000 x 44,000 ly
Distance:	2,500,000 ly from Sun



Location of the Andromeda Galaxy compared to the

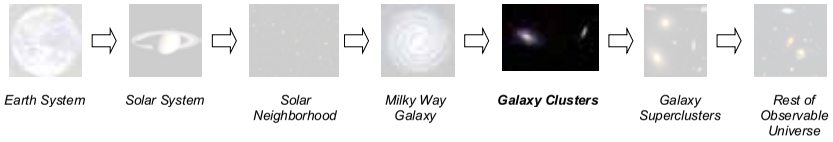
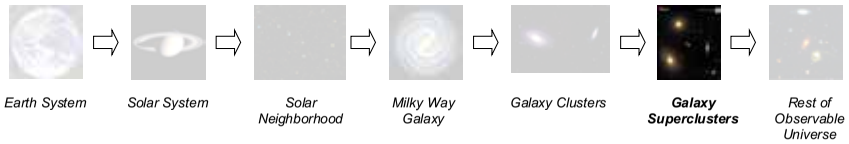


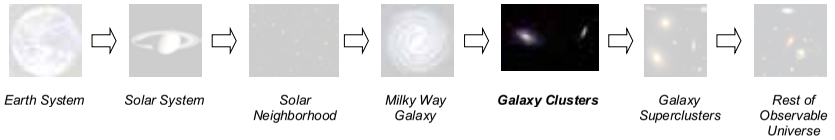
Image courtesy of "Where is M13?" by ThinkAstronomy.com

Object:	Large Magellanic Cloud (constellation Dorado)
Location:	Galaxy Cluster (the LMC is a satellite galaxy of the Milky Way and is found in our Local Group of galaxies)
Size:	30,000 x 25,000 ly
Distance:	170,000 ly from Sun

Location of LMC compared to the Milky Way (Sun is orange dot; LMC is red circle). Size is not to scale.

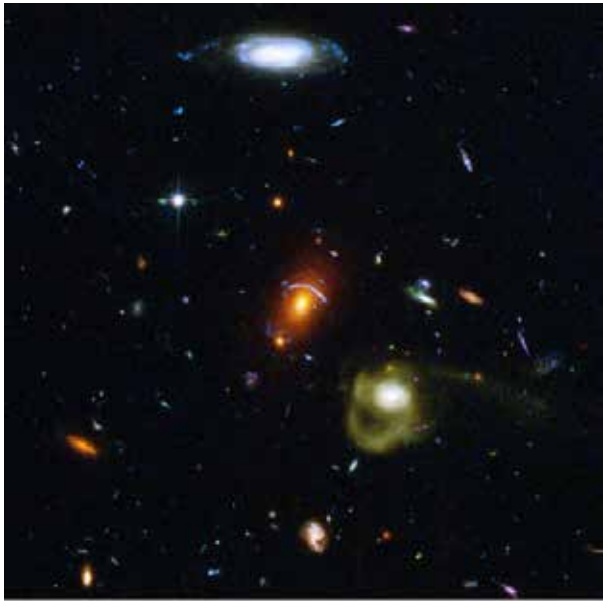


Object:	Virgo Supercluster (hundreds of galaxies in constellation Virgo)
Location:	Galaxy Supercluster (our Local Group is just a small part of this larger supercluster of galaxies)
Size:	Over 100,000,000 ly in diamter
Distance:	The closest galaxies in our supercluster are only 170,000 ly distant (Large and Small Magellanic Clouds); the most distant members are almost 100,000,000 ly distant



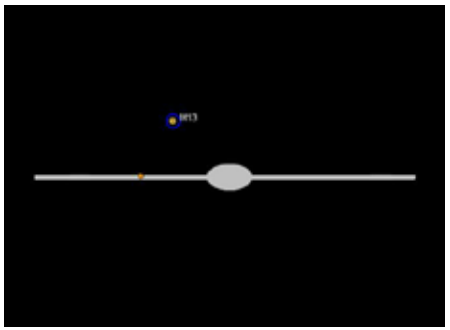
Object:	Stephan's Quintet (5 galaxies in constellation Pegasus)
Location:	Galaxy Cluster (far from our Local Group of galaxies)
Size:	Tens of millions of ly in diamter
Distance:	4 of 5 galaxies are 290,000,000 ly from Sun (galaxy to top left is only 40,000,000 ly distant)

Thomas V. Davis (tvdavisastropix.com)

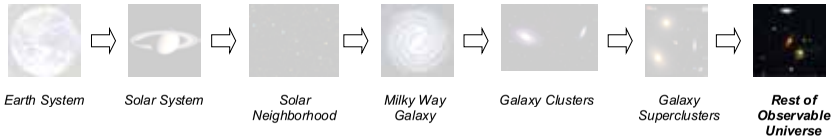


Object:	M13 globular cluster (constellation Hercules)
Location:	Milky Way Galaxy (globular clusters are found outside the plane of the galaxy orbiting its nucleus)
Size:	146 ly in diameter
Distance:	25,000 ly from Sun

Image courtesy of "Where is M13?" by ThinkAstronomy.com



Location of M13 in our galaxy (Sun is orange dot; M13 is yellow crosshair)



Object:	Hubble Deep Field (showing thousands of galaxies packed into a speck of the sky the size of the width of a dime viewed from 75 feet away)
Location:	Rest of the observable universe (far beyond our Virgo Supercluster of galaxies)
Size:	These galaxies span millions of ly in diameter
Distance:	Billions of ly distant (the edge of the observable universe)